PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

# 1999 Dinosaur Reservoir Creel Survey Report

J. Joslin
May 2001

PWFWCP Report No. 238

105-02252/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

**Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9**

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: J. Joslin. May 2001. 1999 Dinosaur Reservoir Creel Survey Report. Peace/Williston Fish and Wildlife Compensation Program. Report No. 238. 19pp plus appendices.

Author(s): Jake Joslin[1]
Address(es): [1] Box 456 Hudson's Hope B.C. V0C 1V0

1999 Dinosaur Reservoir

# Creel Survey Report

Jacob Joslin

Box 456
Hudson's Hope BC
V0C 1V0

jjoslin@visto.com

May 2001

## EXECUTIVE SUMMARY

An evaluation of the Dinosaur Reservoir stocking program was conducted during the summer of 1999. Anglers were surveyed for a period of 15.5 weeks from the holiday long weekend of May to the holiday long weekend of September. The survey used a double stratified random creel sampling method based on Dixon (1986).

An estimated total of 1787 (+/- 359) anglers utilized Dinosaur Reservoir during the summer creel survey period. These anglers expended 3772 (+/- 764) hours to catch an estimated 1276 (+/- 121) fish. Of these, 898 (+/- 98) were rainbow trout. This represented an overall catch rate of .31 (+/- .08) fish per hour. The success rate varied considerably by month and whether the party was using boat (.39 fish per hour) or shore (.09 fish per hour). The average angler day was 2.06 hours (+/- 0.20). Sixty seven percent of fish were released. Local fishermen accounted for most anglers (86.5%) utilizing Dinosaur Reservoir during the 1999 season.

Unlike previous studies, no data was available for comparing wild and stocked populations. Marked fish were released in July that will be used for gathering information during the summer of 2000.

## TABLE OF CONTENTS


| | Page Number |
|---|---|
| **EXECUTIVE SUMMARY** | 1 |
| **LIST OF TABLES AND FIGURES** | 3 |
| **INTRODUCTION** | 5 |
| Background | 5 |
| Objectives | 5 |
| **METHODS** | 6 |
| **RESULTS** | 9 |
| Angler Data | 9 |
| Biological Data | 11 |
| **DISCUSSION** | 17 |
| Comparisons with Previous Surveys | 17 |
| Observations | 18 |
| Summary | 19 |
| **LITERATURE CITED** | 20 |
| **APPENDIX A** - Reference Literature | 21 |
| **APPENDIX B** - Data Summary | 22 |

## LIST OF TABLES AND FIGURES


| | | Page Number |
|---|---|---|
| Figure 1. | Map and location of Dinosaur Lake. | 4 |
| Figure 2. | Catch per angler hour with angler days, by month. | 10 |
| Figure 3. | Length vs. weight of sampled Rainbow Trout. | 13 |
| Figure 4. | Fork length frequencies of sampled Rainbow Trout. | 14 |
| Figure 5. | Age frequency of sampled Rainbow Trout. | 15 |
| Figure 6. | Age vs. Fork Length of sampled Rainbow Trout | 16 |
| Table 1. | Release rates by species. | 9 |
| Table 2. | Visitor residency. | 9 |
| Table 3. | Angling capture methods. | 10 |
| Table 4. | Number of fish samples taken. | 11 |
| Table 5. | Average lengths (mm) and weights (grams) of sampled fish. | 12 |
| Table 6. | Estimated total catch. | 12 |
| Table 7. | Key comparisons with previous years. | 17 |

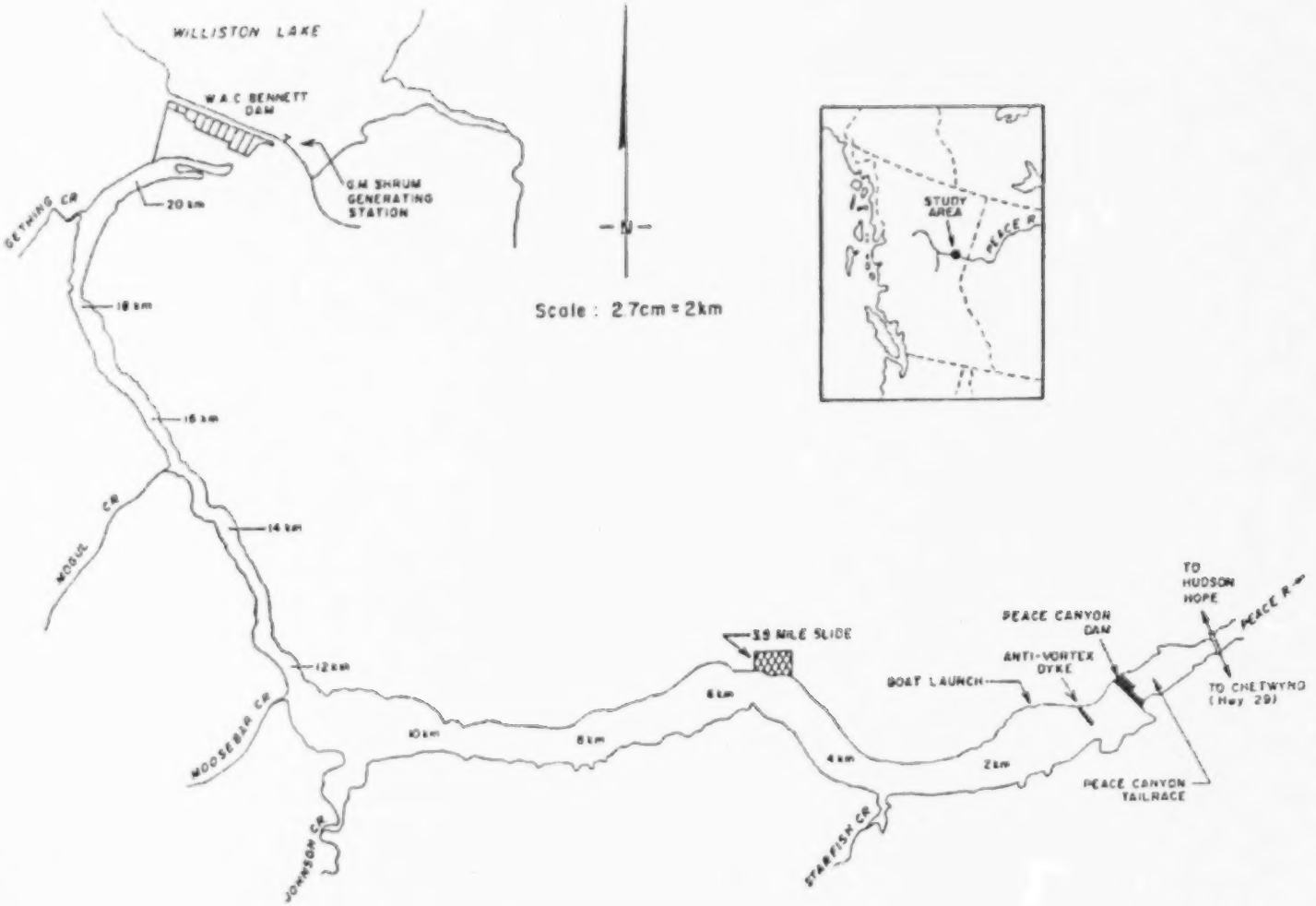


Figure 1. Map and Location of Dinosaur Lake.

# INTRODUCTION

## Background

Dinosaur Reservoir was formed in 1980 with the completion of the Peace Canyon Dam. In order to provide improved recreational angling opportunities this reservoir has been stocked with rainbow trout *(Oncorhynchus mykiss)*. The stocking was carried out by the Peace Canyon Hatchery (funded by B.C. Hydro) until 1988 when the facility was closed. Since that time the reservoir has been stocked with fish provided by the Ministry of Environment Lands and Parks. The angler surveys conducted from 1984 to 1988 suggested that many of the trout released into the reservoir moved downstream through the dam and into the Peace River, but that the remaining "hatchery" fish comprised about 50% of the total catch from Dinosaur Reservoir. Angler success was rated as low but the reservoir received relatively high angling pressure (Hammond, 1988; Pattenden and Ash, 1993b).

Since the closure of the hatchery in 1988 the creel survey evaluation program has been inactive. It is unknown if any major changes have occurred in the fishery over the last eleven years and if the current regime of annual stocking is effective.

## Objectives

An evaluation of the fishery in Dinosaur Reservoir is required to determine the effectiveness of the stocking program. The information gathered may also be used in the development of management strategies for Dinosaur Reservoir and provides baseline data for the evaluation of possible future enhancement projects. The survey and evaluation also hopes to determine the state of the sport fishery relative to the costs of stocking and enhancement.

## METHODS

A creel survey was conducted at the single road access point to Dinosaur Reservoir. The purpose was to determine angler effort, success rates and other user information. The survey followed the methodologies of a "Double Stratified Random Sample Creel Survey" (Dixon 1986).

1999 was the longest survey period to date, with most of the previous surveys lasting about 9 weeks from early July to early September. A minimum of five sample periods were utilized each week from May 24 weekend until Labour Day, a period of 15.5 weeks. Sampling was divided into four strata, which were analyzed separately to increase statistical significance of the results. Strata were defined as:

| | |
|---|---|
| Weekend AM - 7:30am-3:00pm | Strata 1 |
| Weekend PM - 3:00pm-10:30pm | Strata 2 |
| Weekday AM-7:30am-3:00pm | Strata 3 |
| Weekend PM - 3:00pm-10:30pm | Strata 4 |

Sample periods were 7.5 hours in duration. Holiday weekdays counted as weekends.

Information was recorded for angler data and biological data. All anglers returning during the sampling period were surveyed. A small number (~3) of shore anglers were missed, usually because they returned to the campsite on smaller side trails or simply drove away before the surveyor could question them. The survey was voluntary, but no refusals were encountered.

Angler data recorded included:

- Time angling trip was concluded.
- Boat or Shore angler(s).
- Repeat visitors (y/n).
- Number in party.

- Number of anglers in party.
- Number of fishing rods typically used at any one time.
- Where does the angler normally reside: Local (Peace River Area), Resident (B.C.), Non Resident (Canada but not BC) or Non-Canadian.
- How many hours did the angler(s) fish?
- What type of terminal gear was used: Bait (any gear with bait on it) Hardware or Fly.
- How many fish, by species, were killed or released and any marks on fish kept and released.

Biological information was collected on all harvested fish that were not cleaned, and many that were cleaned but with heads intact. Others were not sampled because of time constraints during a busy period, or if the angler was in a hurry. A total of 94 fish were sampled out of a possible 150. All but 5 of the samples were rainbow trout.

Biological information recorded included:

- Species. The following abbreviations are in use throughout this report:

  RBT = Rainbow Trout

  KO = Kokanee

  WG = Whitefish (General)

  BT = Bull Trout

  LT = Lake Trout

- Weight (g)
- Length (mm)
- Capture Method (Bait, Hardware, or Fly)
- Age (Scale Sample)
- Ageing Method
- Date
- Marks
- Comments

Approximately 5000 large catchable (Avg. 158.2 g) adipose fin clipped rainbow trout were released into Dinosaur Reservoir on July 27, 1999. This is an attempt to determine the contribution that this size of fish will make to the fishery and to help determine the contribution of stocked fish to the overall fishery. These are the only marked fish in the lake, as previous stocked fish have not been marked since the on-site hatchery closed. Because the fish were released late in the season and very few fish were caught after their release, the sample was too small to estimate populations. In addition, the released fish were borderline legal size (with a high variance), and it was found that many anglers released fish in this size range, even if they were legal. In most cases there was an assumption that the size requirement for Dinosaur Reservoir was 30 cm like other lakes and streams in the area. Another common reason given by anglers was a desire for a 'sporting' experience. Smaller fish were often released in the hunt for larger fish.

This report will not deal in depth with these released fish. It is felt the fish will mature to a more realistic catchable size for the 2000 season, and they will be available for the entire survey period. They will provide useful information for the creel survey of 2000.

Eight thousand nine hundred (8,900) smaller fish (Avg. 65 g) were released at the same time. These 1999 brood fish averaged 17.5 centimetres in length. They were marked with a ventral fin clip for future identification, but are not expected to be seen in the 2000 survey.

## RESULTS

**Angler Data** *(all confidence intervals are at 95% level)*

A total of 705 anglers in 333 parties were interviewed. From this it was estimated a total of 1787 (+/- 359) anglers utilized Dinosaur Lake during the summer creel survey period in 1999. These anglers expended 3772 (+/- 764) hours to catch an estimated 1276 (+/- 121) fish, 898 (+/- 98) which were rainbow trout. The contribution of stocked fish is not known.

Average angler overall catch rate was 0.31 (+/- 0.08) fish per hour, or 0.64 (+/- 0.17) fish per day. The average angler day was 2.06 hours (+/- 0.20). The success rate varied considerably by month and whether the party was using boat (.39 fish per hour) or shore (.09 fish per hour). 67% of fish were released (59% of rainbow trout, see Table 1). The average shore angler party was comprised of 1.75 people while the average boat angler party was comprised of 2.25 people.

Table 1. Release rates by species.

| Release Rate (%) | | | | | |
|---|---|---|---|---|---|
| ***RBT*** | ***LT*** | ***BT*** | **WG** | ***KO*** | ***ALL*** |
| 58.7% | 68.8% | 93.5% | 85.7% | 50.0% | 67.1% |

Local fishermen accounted for most anglers (86.5%) utilizing Dinosaur Lake during the 1999 season (See Table 2). This is comparable with previous surveys.

Table 2. Visitor residency.

| Visitor Residency | | | | |
|---|---|---|---|---|
| | *Local* | *Res* | *Non-Res* | *Non-Can* |
| Season (n) | 800 | 32 | 82 | 11 |
| Season (%) | 86.5% | 3.5% | 8.9% | 1.2% |

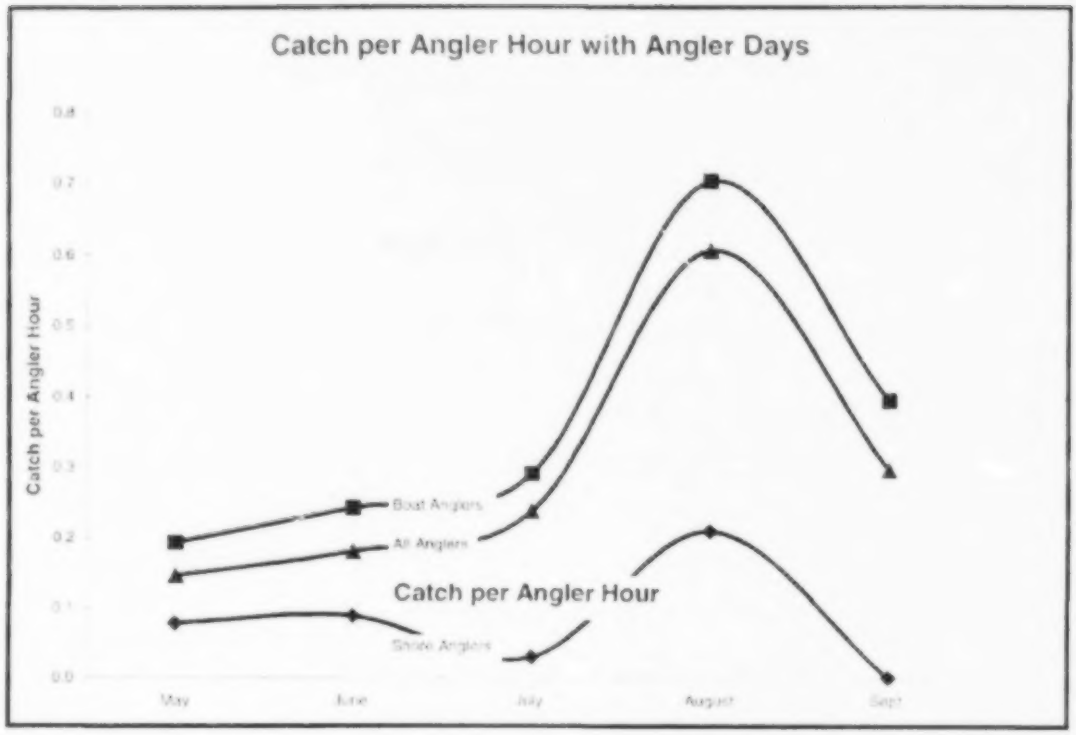


Figure 2. Catch per angler hour with angler days, by month.

Table 3. Angling capture methods.

| Capture Methods | | *n* | % |
|---|---|---|---|
| | Bait | 131 | 39.3% |
| | Hardware | 272 | 81.7% |
| | Fly | 88 | 26.4% |
| | Combination | 138 | 41.4% |
| | Total Parties | 333 | |

**Biological Data**

Rainbow trout was the predominant sport fish captured by anglers on Dinosaur Lake (70%). Biological data was collected on 94 sport fish harvested during the survey period. This included 89 Rainbow Trout, 2 Lake Trout, 2 Whitefish, and 1 Kokanee. No Bull Trout were sampled. There were no confirmed or reported catches of Arctic Grayling, Lake Whitefish or Burbot.

An estimated 1276 fish were caught during the creel census of 1999. Most of these (898) were rainbow trout. There were no obvious signs of parasites or disease, both caught and sampled fish appeared healthy. Condition factors were highly variable in each age class (2 years to 6 years). No significant changes in condition were evident as fish aged. Tables 4 to 6 and Figures 3 to 6 illustrate key findings (see below).

Table 4. Number of fish samples taken.

| | *May* | *June* | *July* | Aug | *September* | *Season* |
|---|---|---|---|---|---|---|
| Samples Taken | 11 | 21 | 35 | 27 | 0 | 94 |
| Species Distribution | | | | | | |
| RBT | 10 | 19 | 34 | 26 | 0 | 89 |
| LT | 0 | 0 | 1 | 1 | 0 | 2 |
| BT | 0 | 0 | 0 | 0 | 0 | 0 |
| WG | 1 | 1 | 0 | 0 | 0 | 2 |
| KO | 0 | 1 | 0 | 0 | 0 | 1 |

Table 5. Average lengths (mm) and weights (grams) of sampled fish.

| Avg. Sample Length | *May* | *June* | *July* | *Aug* | *September* | *Season* |
|---|---|---|---|---|---|---|
| RBT | 366.5 | 353.3 | 335.9 | 303.2 | | 333.5 |
| LT | | | 499 | 500 | | 499.5 |
| WG | 320 | 316 | | | | 318 |
| Avg. Sample Weight | | | | | | |
| RBT | 528 | 465 | 393 | 271 | | 398 |
| LT | | | 1729 | 1219 | | 1474 |
| WG | 375 | 338 | | | | 357 |

Table 6. Estimated total catch.

| Estimated Total Catch (Killed + Released) | | | | | | |
|---|---|---|---|---|---|---|
| | *RBT* | *LT* | *BT* | *WG** | *KO* | *TOTAL* |
| May | 48 | 0 | 10 | 5 | 3 | 65 |
| June | 114 | 0 | 17 | 6 | 3 | 140 |
| July | 338 | 23 | 54 | 51 | 6 | 471 |
| August | 305 | 21 | 5 | 160 | 0 | 491 |
| Sept. | 120 | 0 | 0 | 0 | 0 | 120 |
| Season | 898 | 45 | 87 | 236 | 11 | 1276 |
| Confidence | (+/-)98 | | | | | |

* *See discussion on page 18 regarding whitefish estimate.*

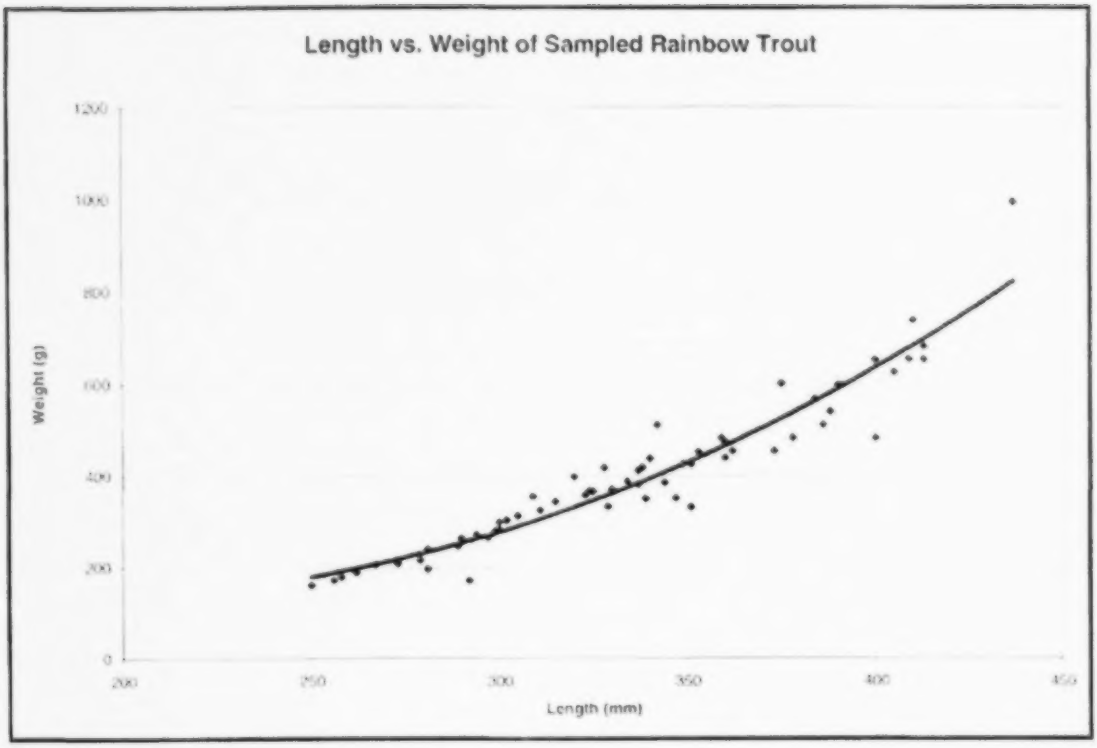


Figure 3. Length vs. weight of sampled Rainbow Trout.

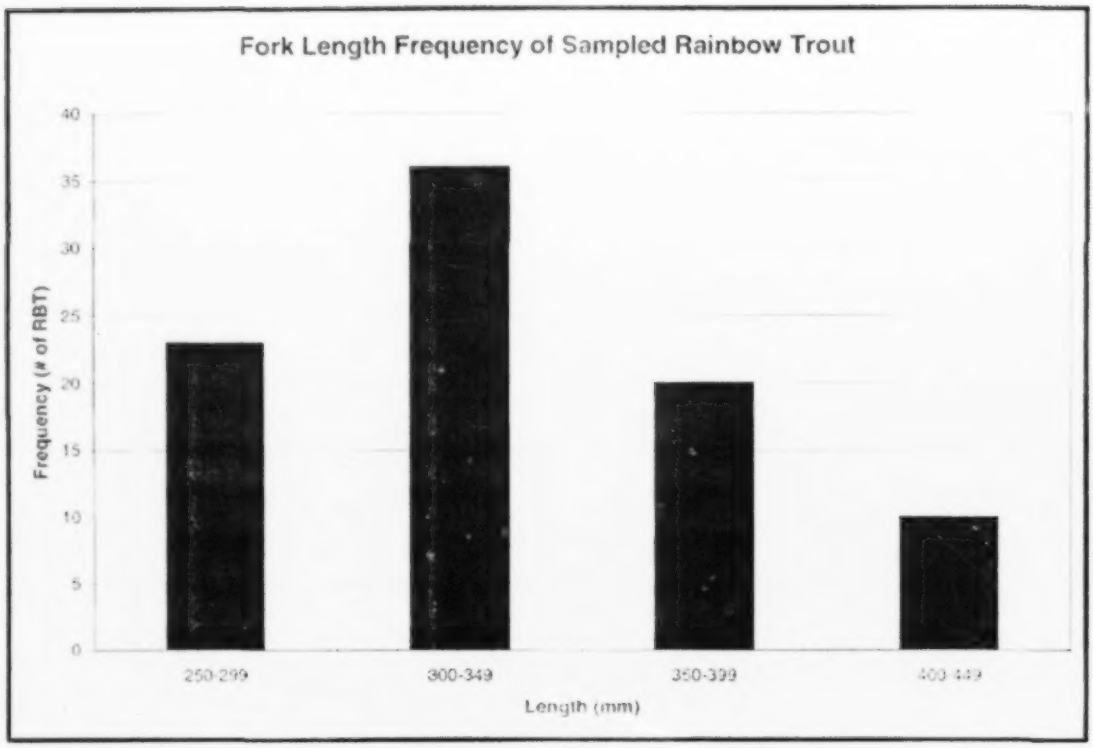


Figure 4. Fork length frequency of sampled Rainbow Trout.

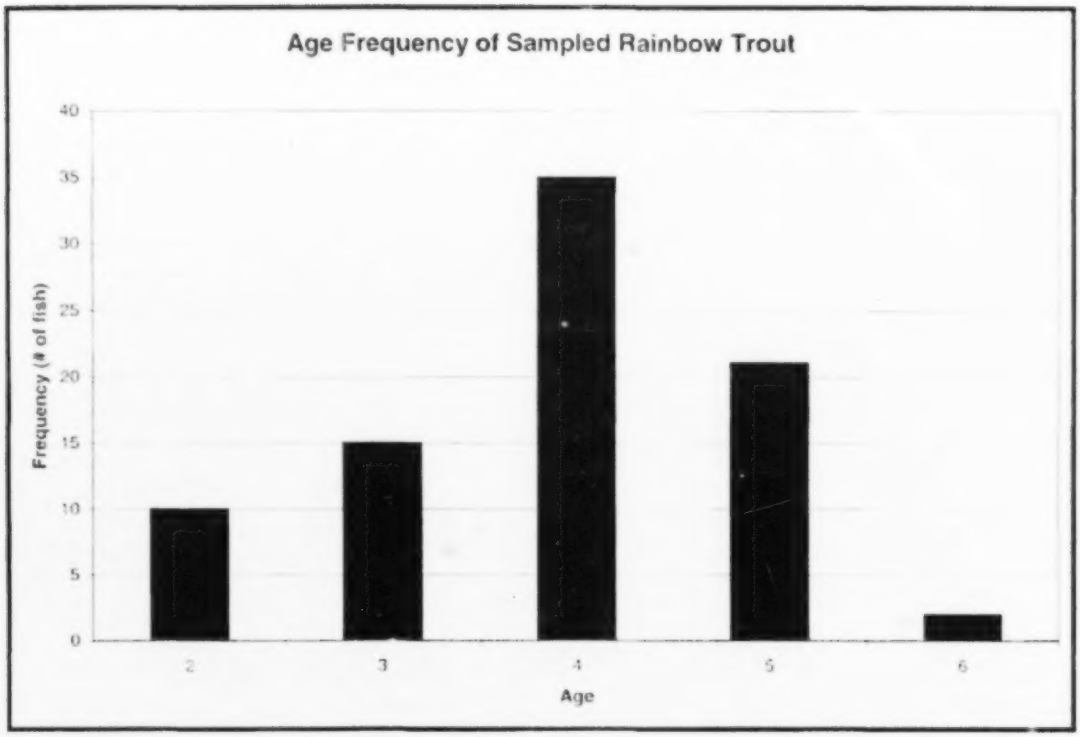


Figure 5. Age frequency of sampled Rainbow Trout.

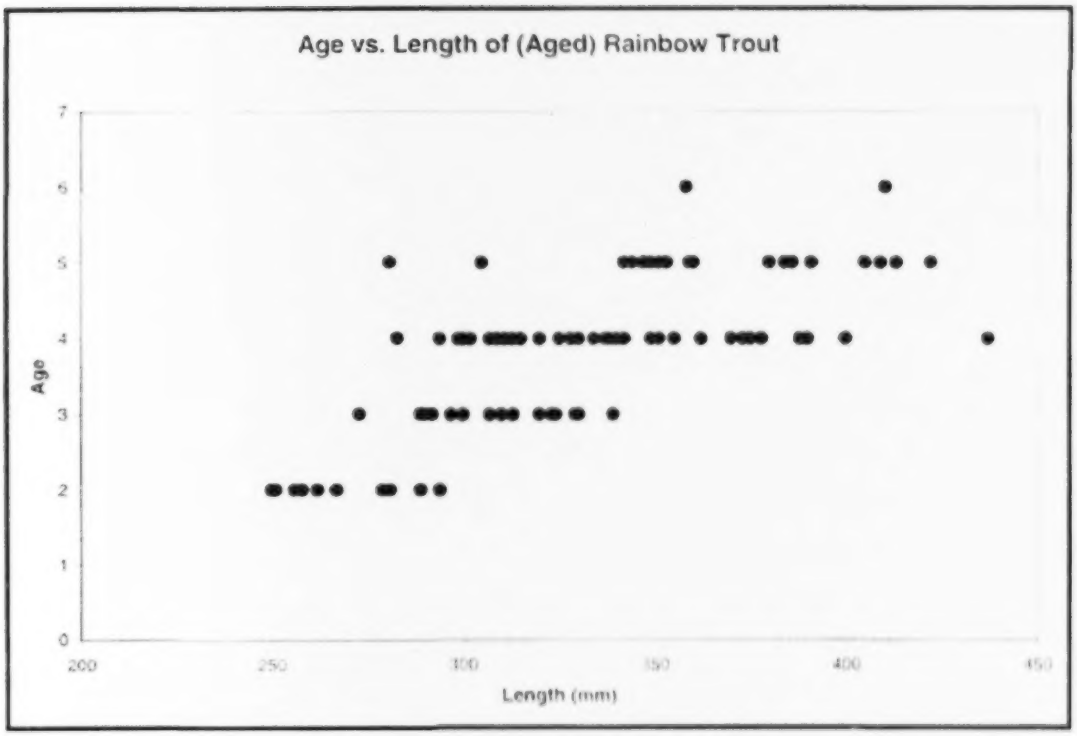


Figure *6.* Age vs. Fork Length of sampled Rainbow Trout

## DISCUSSION

### Comparisons with Previous Surveys

The primary difference between 1999 and previous creel surveys was the lack of information on Wild/Hatchery rainbow trout. All fish in the reservoir were unmarked because more than ten years elapsed since the last tagged fish were released. 5000 marked Rainbow Trout were released into the reservoir on July 27th, 1999 to evaluate the contribution of released fish to the fishery. These fish were catchable (Avg. 158.2 g) with adipose fin clips. No valid data will be collected until the summer of 2000 because of the late release date and small size of fish. This means the 1999 creel survey ignores a significant component of previous surveys, the comparisons between wild and hatchery stocks and estimates of the importance of the stocked fish to the overall fishery.

A summarization of key comparisons follows (From Pattenden & Ash, 1993b). Note that the survey period for 1999 was considerably longer than previous years.

Table 7. Angling data comparisons with previous Dinosaur Lake surveys (1984-1999).

| *Year* | *Effort (Anglers)* | *Effort (Hours)* | *Catch* | *Harvest* | *Proportion Harvested* | *Catch Rate (Fish/hr)* | *Composition* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | *%Wild* | *%Hatchery* |
| 1984 | 4702 | 13470 | 3965 | 3965 | 1.00 | 0.29 | 41.2 | 58.8 |
| 1985 | 1237 | 3940 | 1195 | 627 | 0.52 | 0.30 | 64.4 | 35.6 |
| 1986 | 2044 | 6397 | 2380 | 799 | 0.33 | 0.37 | 53.2 | 46.8 |
| 1987 | 1240 | 2932 | 597 | 274 | 0.45 | 0.20 | 48.6 | 51.4 |
| 1988 | 1599 | 3496 | 997 | 421 | 0.42 | 0.29 | 47.9 | 52.1 |
| 1999 | 1787 | 3772 | 1276 | 421 | 0.33 | 0.31 | N/A | N/A |

**Observations**

Angler satisfaction was not measured quantitatively, but there appeared to be a perception of below average angling opportunities and inconsistent success. The actual success rate of .31 fish per hour is rated as low by Pattenden & Ash (1993b), but may be comparable to other opportunities in the region (Blackman & Newshome, 1993). Many who experienced low or moderate success did not express surprise or disappointment. The reservoir has now been fished for almost twenty years, and the moderate success levels seem to be well known to local anglers (who make up 86.5% of angler visits). Use levels would likely respond quickly to increases or decreases in success rates. This potential effect of the stocking program should be realized.

Qualitative observation and discussion revealed a profile of the typical angler as a local visitor, in a boat, with low to average angling skill and experience, and concerned with overall experience (scenery, weather, socialization etc.) as much as angling success. These anglers often were fishing as a secondary activity; the main reason for the visit was boating. The scenery and length of the reservoir make it ideal for boating and sightseeing.

The existence of a municipal campground adjacent to the boat launch allows continued popularity on weekends, mostly with local families (Ft. St. John, Dawson Creek, and Chetwynd). It also exposes a transient clientele of anglers who are generally stopping for one night on their way to/from Alaska.

The success rate varied considerably by month and whether the party was using boat (.391 fish per hour) or shore (.087 fish per hour). The huge difference in success is primarily due to the lack of good fish habitat that is accessible on foot. Many areas near the campground are shallow mud/rock flats. In addition, boat anglers may be more skilled and experienced.

The high number of whitefish is due to reports of large catches of what were likely Flathead Chub *(Platygobio gracilis)* or Northern Squawfish *(Ptychocheilus oregonensis)*. This results in an over-representation of whitefish in the catch analysis (see Table 6). As well, small

sample sizes and large variance for most species resulted in too much error for meaningful confidence intervals. Only data for rainbow trout was considered valid. Unlike previous studies, no data was available for comparing wild and stocked populations. Marked fish were released in July that will be used for gathering information during the summer of 2000.

Regarding the downstream movement of released fish, Hammond (1986) monitored release and found fish moved from GMS Tailrace to lower Dinosaur Reservoir in a period of less than three weeks. This led to considerable concern over the rapid entrainment of fish through the Peace Canyon Dam (Hammond, 1986). In July 1999 three newly released adipose clipped fish were captured at the vortex dam log boom four days after being released at the GMS Tailrace. These were the larger size 'catchable' fish (1998 brood). Clearly entrainment remains a major concern and is likely having a major impact on stocking in the reservoir. It is unknown exactly how many fish travel through the Peace Canyon Dam, or the resulting mortality rate.

**Summary**

Estimated catch rates for previous surveys remained relatively constant, ranging between 0.37 fish/h in 1986 to 0.20 fish/h in 1987. The 1999 overall catch rate of .31 (+/- .08) fish/h falls well within this range, suggesting the fishery has not changed considerably over the intermittent decade. The contribution made from stocking is unknown. In the past it was around 50% (Hammond, 1987). It is likely that regenerative capabilities of the wild population will not succeed in maintaining a strong fishery without habitat enhancement. For a discussion of habitat enhancement options see Pattenden & Ash (1993a).

## ACKNOWLEDGEMENTS

Thanks are due to Brian Blackman for designing the program and for review and advise on the production of the report and also to Nick Baccante for his reviews and advise on the production of the report.

## LITERATURE CITED

Blackman, B. and K. Newshome (1993). Williston Reservoir 1989 creel report. Unpublished report.

Dixon, B. M. (1986). Instruction for a double random sample creel survey. BC Ministry of Environment. Prince George. 16pp. plus appendices.

Hammond, R. J. (1986). Evaluation of Dinosaur Lake stocking program (1986 - year 4). 60pp.

Hammond, R. J. (1987). Evaluation of Dinosaur Lake stocking program summary report. 10pp.

Pattenden, R. and G. Ash. (1993a). Fisheries enhancement options for Dinosaur Lake: A review. Peace/Williston Fish and Wildlife Compensation Program Report No. 72. 38pp. plus appendices.

Pattenden, R. and G. Ash. (1993b). Dinosaur Lake summer creel surveys, results of the 1988 program and a five year review (1984 - 1988). Peace/Williston Fish and Wildlife Compensation Program Report No. 73. 26pp. plus appendices.

## APPENDIX A - Reference literature

Hammond, R. J. (1985). Dinosaur Lake Summer Creel Survey. 20p.

Hammond, R. J. (1987). Dinosaur Lake Summer Creel Survey. 20p.

Hammond, R. J. (1984). Evaluation of Dinosaur Lake Stocking Program (1984 - year 2). 86p.

## APPENDIX B

### Data Summary (with 95% Confidence Intervals)

**Note: Results cover sample period ONLY (May 22 - Sept 6)**

**Total # Anglers**

| | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|
| May | 35(+/-38) | 123(+/-71) | 15(+/-8) | 5(+/-0) | 178(+/-117) |
| June | 48(+/-28) | 114(+/-44) | 29(+/-16) | 145(+/-47) | 336(+/-136) |
| July | 98(+/-46) | 306(+/-74) | 74(+/-27) | 252(+/-103) | 729(+/-249) |
| August | 95(+/-43) | 185(+/-57) | 42(+/-17) | 97(+/-51) | 419(+/-168) |
| Sept. | 27(+/-28) | 51(+/-25) | 0 | 0 | 78(+/-53) |
| Season | 304(+/-74) | 783(+/-122) | 164(+/-34) | 535(+/-129) | 1787(+/-359) |

*Note: Season is not sum of monthly calculations.*

**Average Angler Day: 2.0639 Hours +/- 0.195744**

**Total # Angler Days**

(Total Angler hours/Average Angler Day)

| | |
|---|---|
| May | 164.7 |
| June | 287.3 |
| July | 739.5 |
| August | 545.7 |
| Sept. | 90.1 |
| Season | 1827.4 |

**Total Angler Hours**

| SUM | May | June | July | Aug | Sept | Combined |
|---|---|---|---|---|---|---|
| 1 | 55.0 | 75.6 | 176.8 | 174.4 | 45.0 | 526.8 |
| 2 | 243.9 | 186.9 | 761.1 | 613.1 | 141.0 | 1946.0 |
| 3 | 28.5 | 54.1 | 110.6 | 72.6 | 0.0 | 265.8 |
| 4 | 12.5 | 276.4 | 477.9 | 266.2 | 0.0 | 1033.0 |
| Month | 339.9 | 593.0 | 1526.4 | 1126.3 | 186.0 | 3771.6 |

| CI | May | June | July | Aug | Sept | Combined |
|---|---|---|---|---|---|---|
| 1 | 54.5 | 41.5 | 82.5 | 59.4 | 45.0 | 113.4 |
| 2 | 89.0 | 113.9 | 208.8 | 201.6 | 70.3 | 336.4 |
| 3 | 58.4 | 47.2 | 53.3 | 23.5 | 0.0 | 75.2 |
| 4 | 0.0 | 101.5 | 149.3 | 186.3 | 0.0 | 239.2 |
| Month | 201.9 | 304.1 | 493.9 | 470.8 | 115.3 | 764.1 |

**Average Anglers per Party**

| Boat | Shore |
|---|---|
| 2.25 | 1.7528 |

**Boat/Shore Composition**

| | Boat | Shore | Total |
|---|---|---|---|
| # Parties | 244 | 89 | 333 |
| % | 73.3% | 26.7% | 100.0% |

**Visitor Residency**

| | Local | Res | Non-Res | Non-Can |
|---|---|---|---|---|
| Season (n) | 800 | 32 | 82 | 11 |
| Season (%) | 86.5% | 3.5% | 8.9% | 1.2% |

**Average Catch per Angler Hour (all species)**

| | Boat | Shore | Combined |
|---|---|---|---|
| May | 0.193 | 0.078 | 0.146 |
| June | 0.242 | 0.088 | 0.180 |
| July | 0.290 | 0.029 | 0.237 |
| August | 0.703 | 0.208 | 0.605 |
| Sept. | 0.394 | 0.000 | 0.296 |
| Season | 0.391 | 0.087 | 0.309 |

**Average Catch per Angler Day (all species)**

| | Boat | Shore | Combined |
|---|---|---|---|
| May | 0.398 | 0.161 | 0.301 |
| June | 0.499 | 0.182 | 0.372 |
| July | 0.599 | 0.060 | 0.489 |
| August | 1.450 | 0.430 | 1.249 |
| Sept. | 0.813 | 0.000 | 0.611 |
| Season | 0.807 | 0.180 | 0.638 |

**Estimated Total Catch (# Fish)**

| | | |
|---|---|---|
| May | 65.0 | |
| June | 140.0 | |
| July | 470.6 | |
| August | 490.8 | |
| Sept. | 120.0 | |
| Season | 1276.4 | +/- 120.5 |

**Average Catch per Party per Day**

| Killed | Released | Total |
|---|---|---|
| 0.450 | 0.922 | 1.372 |

**Release Rate (%)**

| RBT | LT | BT | WG | KO | ALL |
|---|---|---|---|---|---|
| 58.7% | 68.8% | 93.5% | 85.7% | 50.0% | 67.1% |

**Estimated Total Killed**

| | RBT | LT | BT | WG | KO | TOTAL |
|---|---|---|---|---|---|---|
| May | 35.0 | 0.0 | 0.0 | 2.5 | 0.0 | 37.5 |
| June | 51.4 | 0.0 | 0.0 | 5.7 | 2.9 | 60.0 |
| July | 152.2 | 8.5 | 5.6 | 25.4 | 2.8 | 194.5 |
| August | 95.6 | 5.2 | 0.0 | 0.0 | 0.0 | 100.8 |
| Sept. | 18.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 |
| Season | 361.9 | 14.0 | 5.6 | 33.7 | 5.6 | 420.8 |
| CI (+/-) | 67.8 | Note: Small sample sizes and high variance for most species resulted in too much error for meaningful confidence intervals. | | | | |

**Estimated Total Released**

| | RBT | LT | BT | WG | KO | TOTAL |
|---|---|---|---|---|---|---|
| May | 12.5 | 0.0 | 10.0 | 2.5 | 2.5 | 27.5 |
| June | 62.9 | 0.0 | 17.1 | 0.0 | 0.0 | 80.0 |
| July | 186.0 | 14.1 | 47.9 | 25.4 | 2.8 | 276.2 |
| August | 209.3 | 15.5 | 5.2 | 160.2 | 0.0 | 390.1 |
| Sept. | 102.0 | 0.0 | 0.0 | 0.0 | 0.0 | 102.0 |
| Season | 535.8 | 30.9 | 81.4 | 202.0 | 5.6 | 855.6 |
| CI (+/-) | 30.0 | Note: Small sample sizes and high variance for most species resulted in too much error for meaningful confidence intervals. | | | | |

**Estimated Total Catch (Killed + Released)**

| | RBT | LT | BT | WG | KO | TOTAL |
|---|---|---|---|---|---|---|
| May | 48 | 0 | 10 | 5 | 3 | 65 |
| June | 114 | 0 | 17 | 6 | 3 | 140 |
| July | 338 | 23 | 54 | 51 | 6 | 471 |
| August | 305 | 21 | 5 | 160 | 0 | 491 |
| Sept. | 120 | 0 | 0 | 0 | 0 | 120 |
| Season | 898 | 45 | 87 | 236 | 11 | 1276 |
| CI (+/-) | 98 | Note: Small sample sizes and high variance for most species resulted in too much error for meaningful confidence intervals. | | | | |

**Capture Methods**

| | n | % |
|---|---|---|
| Bait | 131 | 39.3% |
| Hardware | 272 | 81.7% |
| Fly | 88 | 26.4% |
| Combination | 138 | 41.4% |
| Total Parties | 333 | |

| | May | June | July | Aug | September | Total/Season |
|---|---|---|---|---|---|---|
| **Samples Taken** | 11 | 21 | 35 | 27 | 0 | 94 |
| **Species Distribution** | | | | | | |
| RBT | 10 | 19 | 34 | 26 | 0 | 89 |
| LT | 0 | 0 | 1 | 1 | 0 | 2 |
| BT | 0 | 0 | 0 | 0 | 0 | 0 |
| WG | 1 | 1 | 0 | 0 | 0 | 2 |
| KO | 0 | 1 | 0 | 0 | 0 | 1 |
| **Avg. Sample Length** | | | | | | |
| RBT | 366.5 | 353.3 | 335.9 | 303.2 | na | 333.5 |
| LT | na | na | 499 | 500 | na | 499.5 |
| WG | 320 | 316 | na | na | na | 318 |
| **Avg. Sample Weight** | | | | | | |
| RBT | 528 | 465 | 393 | 271 | na | 398 |
| LT | na | na | 1729 | 1219 | na | 1474 |
| WG | 375 | 338 | na | na | na | 357 |

**Biomass Removed (Total Killed Catch x Avg Weight)**

| | g | Kg |
|---|---|---|
| RBT | 144024 | 144.02 |
| LT | 20674 | 20.67 |
| WG | 12017 | 12.02 |

**Catch per Angler Hour by Number of Parties**

| Catch per Angler Hour | Angling Parties (#) |
|---|---|
| 0.0-0.09 | 211 |
| 0.1-0.19 | 15 |
| 0.2-0.29 | 13 |
| 0.3-0.39 | 16 |
| 0.4-0.49 | 6 |
| 0.5-0.59 | 20 |
| 0.6-0.69 | 8 |
| 0.7-0.79 | 5 |
| 0.8-0.89 | 1 |
| 0.9-0.99 | 0 |
| 1.0-1.09 | 11 |
| 1.1-1.19 | 2 |
| 1.2-1.29 | 1 |
| 1.3-1.39 | 3 |
| 1.4-1.49 | 1 |
| 1.5-1.99 | 2 |
| 2.0-2.99 | 8 |
| 3.0-3.99 | 6 |
| 4.0-4.99 | 0 |
| 5+ | 1 |